

Have you ever looked at your photographs and thought they were not exactly what you wanted them to be? That they do not live up to what you really experienced? This book will help you create astonishing photographs. It will guide you through all the steps to conquer that photograph you have always craved for. From styles of photography to on how the camera works, you will learn all the techniques and gain the knowledge you need to become a professional.

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Chapter 1 Styles of Photography and Camera Types



Styles of Photography

Landscape Photography

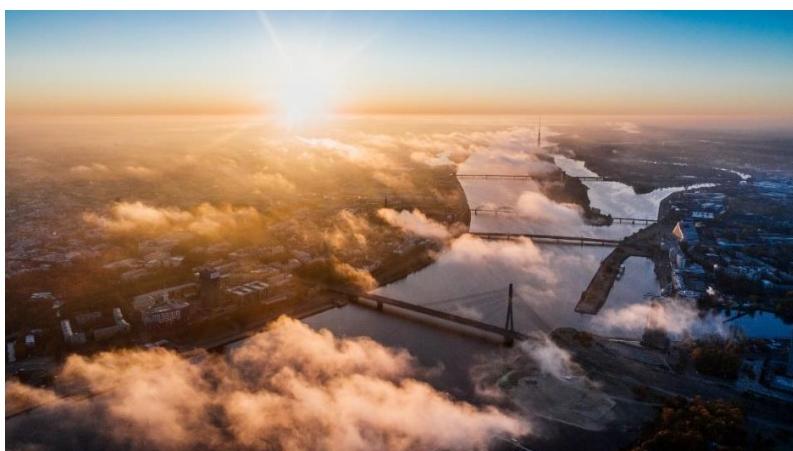
Landscape Photography often tries to represent a particular space and emphasize its beauty. However, Landscape Photography is not always of an extensive and open natural landscape, it can also be of areas where humans have had a noticeable impact.



@Julius Silver

Aerial Photography

Shooting scenes from above. Generally, quite high, from an airplane, a skyscraper or a drone.



@Aleksejs Bergmanis

Architectural Photography

Architectural Photography is about buildings and structures that are visually interesting. It can include both interiors and exteriors.



@Rita Craveiro

Night/Long Exposure Photography

Night or Long Exposure Photography is usually used to capture stationary objects or subjects in low light while allowing moving objects to blur or streak through the scene.



@12019

Portraiture

Portraiture refers to photographing a person or a group of people to capture their expressions, personalities and moods. Usually the face is the focal point of the image. Portraits can be posed for or candid.



@Aamir Mohd Khan



@Aamir Mohd Khan

Candid Photography

Candid Photography is a style that captures the subject very naturally without interference from the photographer. Often, subjects aren't even aware that they are being photographed, which results in very natural and relaxed shots.



@5688709

Fashion Photography

One of the main purposes of Fashion Photography is to sell a product. The goal is to persuade the viewer to purchase the product. The images are usually very creative and visually interesting.



@3179289

Conceptual / Fine Art Photography

Conceptual or Fine Art Photography refers to an image or collection of images where the photographer composes them in order to transmit an idea or concept. The goal is to provoke emotion from the viewer, whether it is joy, mystery, sadness or fear.



@Engin Akyurt

Documentary Photography

Documentary Photography aims to tell a story through an image or set of images. Photo stories can be of a positive nature like animal discoveries and scientific achievements, or they can reflect something negative like starvation, poverty or war.



@Helena

Action/ Sports Photography

Action or Sports Photography allows photographers to be extremely close to the action and create a sense of energy and excitement.



@12019

Photojournalism

Photojournalism is like Documentary Photography. The photographer is capturing a current event and updating the viewers about it as it happens.



@Defence-Imagery

Street Photography

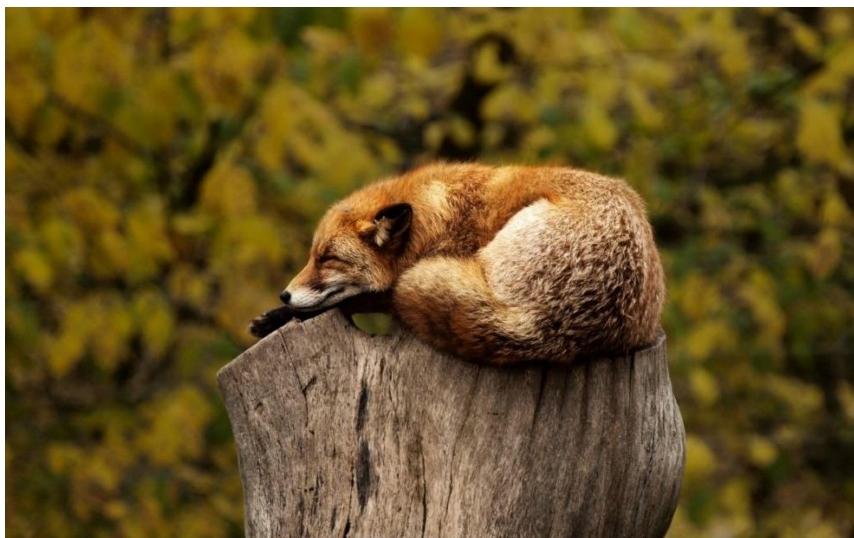
Street Photography captures the daily routines of public spaces. Usually the subjects are people or suburban lifestyles.



@Masashi Wakui

Wildlife Photography

Wildlife Photography refers to capturing wildlife in their natural habitat.



@Pexels

Close Up/ Macro Photography

Close Up Photography means exactly what it says. Getting extremely close to a subject and capturing it to emphasize its features. Macro Photography is to invade the subject, getting in even closer, to the point where the subject is perhaps no longer recognizable.



@Cristian Prisecariu

Food Photography

Food Photography aims to capture images of food in an original, creative and captivating manner.



@RitaE

Camera Types

Point and Shoot Cameras

Sensors of 16 up to 20 Megapixels
Zoom range from 5x to 12x times Optical Zoom



DSLR Cameras

Full manual control
High quality
Exceptional colour depth
Good dynamic range.
Huge range of accessories and add-ons
Ability to change lens
Optical viewfinder



Bridge Cameras

Bridge between Compact and DSLR
Zoom ranges from 40x to 80x
Possibility of manual mode



Mirrorless Cameras

No mirror
Ability to change lens
Less weight
Same quality as DLSR



Medium Format Cameras

Large sensor up to 400 Megapixels
Incredible quality



Smart Phone Cameras

High quality
Very versatile
Share photographs online



Components of a Camera:



Viewfinder

LCD - Liquid Crystal Display



Shutter Button

LCD Screen

Hotshoe: External Flash Connection

Viewfinder: Is where to look through in order to focus and compose a photograph.

LCD - Liquid Crystal Display: A screen that demonstrates the photographs.

Shutter Button: Takes the photographs. When pressed half way will initiate lens focussing.

LCD Screen: Shows and gives information about some of the settings.

Hotshoe: Where to mount an external flash.

Chapter 2 Camera Functions and Lenses



Camera Modes

Automatic Mode (AUTO)

In Automatic Mode, the camera controls everything such as shutters speed, apertures, ISO, etc, in order to get a good exposure.

Program Mode (P)

In Program Mode, the camera controls most settings of the camera such as shutters speed, apertures, ISO, etc, to get a good exposure while letting the user have control over some functions like Autofocus Mode, Drive Mode or Flash.

Pre-Set Modes

Pre-set Modes are Automatic Modes designed for specific scenes and subjects.

- **Sports Mode**

The camera maintains a good exposure while combining a group of settings to capture moving subjects. The camera prioritizes fast shutter speeds to capture motion as static.

- **Landscape Mode**

The camera maintains a good exposure while combining a group of settings to capture scenes where everything is in focus, from the foreground to the background. The camera prioritizes small apertures to produce this.

- **Portrait Mode**

The camera delivers a combination of settings to capture scenes where the main subject is in focus but the background is out of focus. The camera prioritizes large apertures to produce this.

- **Macro Mode**

The camera allows the user to get extremely close to the subject and emphasize its details.

Semi-Automatic Modes

Semi-Automatic Modes let the user take control of some functions while the camera adjusts all other settings to maintain a good exposure.

- **Aperture Value Mode (AV/A)**

The camera permits control over the aperture settings, meaning control of the depth of field. The camera controls all other functions to provide a good exposure.

- **Time Value (TV) or Shutter Priority Mode (S)**

The camera permits control over the shutter speed settings, meaning control of the motion. The camera controls all other functions to provide a good exposure.

Manual Mode (M)

Manual Mode permits full control over all the functions of the camera.



Lens Types

Having knowledge of the different types of lenses that exist is very important for the style of photography the user wants to do.

Lenses are divided into two separate types, Zoom Lenses and Prime/Fixed Lenses.

Zoom Lens

Zoom Lenses can be wide, telephoto or both. Very variable focal length. An example of a Wide Zoom Lens is from 14mm to 24mm. A typical Telephoto Zoom Lens is from 100mm to 400mm. A Zoom lens that evolves either Wide or Telephoto Zoom could be from 24mm to 105mm.

Prime Lens

Prime Lenses are unable to zoom and only have one perspective giving a fixed focal length. Examples of Prime Lens are 17mm, 24mm, 100mm and 300mm.

These two types of lenses have lots of different sub-categories:

Normal Standard Lens

Normal or Standard Lenses are equal to the field of view of human vision that is in focus (50-degree view). On a Full-Frame DSLR a 50mm lens gives us this 50-degree view. The mm can vary depending on the size of the sensor.

Wide Angle Lens

Wide Angle Lenses have a wider field of view than human vision has. The focal length varies between 24mm and 50mm. These lenses are suitable for Landscapes.

Telephoto Lens

Telephoto Lenses have a narrower field of view than human vision has. Their focal length ranges from 50mm up to 1000mm. These lenses are suitable for sports, wildlife, paparazzi and the night sky.

Super Wide-Angle Lens

Super Wide-Angle Lenses have a wide focal length. Examples of these lenses are 10mm, 14mm, 16mm.

Fish Eye Lens

Fish Eye Lenses have a very wide angle of view of about 180 degrees. The images have a substantial distortion around the edges to achieve the Fish Eye effect.

Macro Lens

Macro Lenses let the user get extremely close to subject and still maintain the ability to focus. These lenses are most suitable for capturing details on subjects that are not visible to the naked eye.

Components of a Lens:



Thread for Lens Filters: To attach different types of filters for different effects.

Front Lens Element: The glass in front of the lens

Manual Focusing Ring: To manually focus the lens.

Bayonet for Lens Hood: To attach to the lens. Designed to reduce the camera glare/flare within our photographs.

Distance Scale: Used to evaluate the focus without having to look through the camera.

Zoom Ring: Zoom in/out.

Lens Mount: The part of the lens that communicates with the camera.

Angle of view

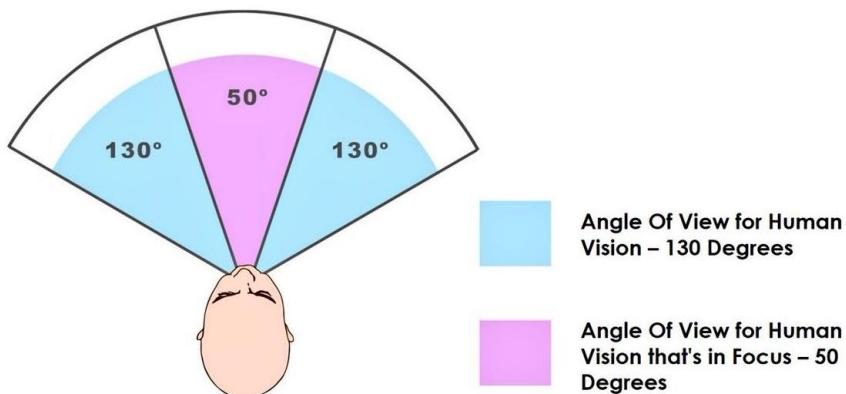
The angle of view of human vision is 130 degrees wide.

There is a huge difference between the width of view that humans can see and the width of view that it is actually in focus.

Humans have peripheral Vision and within this area, the vision is blurred. It is like a survival instinct, just an awareness of what is there.

The angle of view of human vision that can be in focus is 50 degrees wide.

Changing lenses allows the angle of view to become either wider or narrower. Lenses keep everything sharp in the entire view and do not blur at the peripherals, in contrast to human vision.



Chapter 3 Light and Exposure



Exposure – Human Vision vs Camera

Human Vision

The eye has a pupil that opens or closes to control the amount of light coming in, depending on the conditions. It adjusts to different lighting conditions.

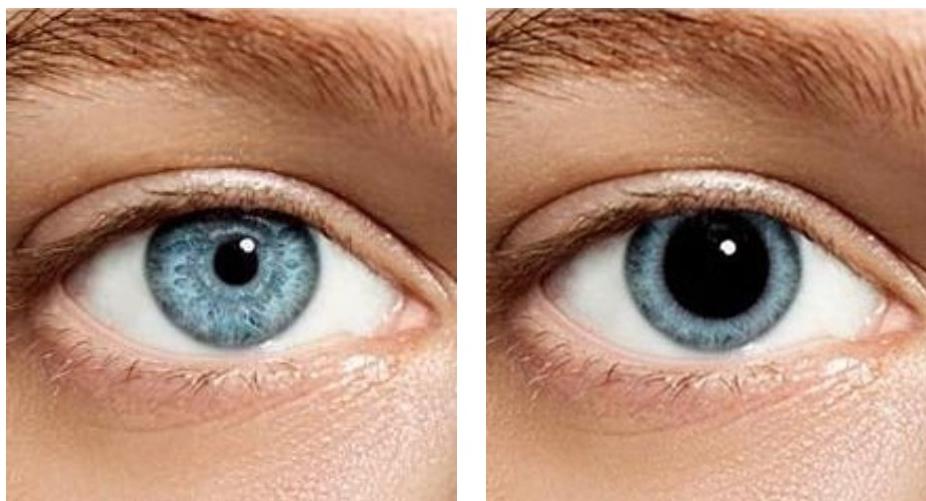
In a dark situation, the pupil opens wide to allow light in, so the environment becomes clearer. In a bright situation, the pupil closes to restrict the light that is coming in. This is all to keep our vision correctly exposed.

Too much light and the vision is over exposed. Too little light and the vision is under exposed.

The pupil has a setting for different lighting conditions. The brain transmits to the pupil how to make adjustments for the current flow of light.

A camera works in the same way. The processor in the camera is aware of when there is too much light or too little light coming in and then transmits to the shutter or the aperture what adjustments it should make to control the amount of light coming in.

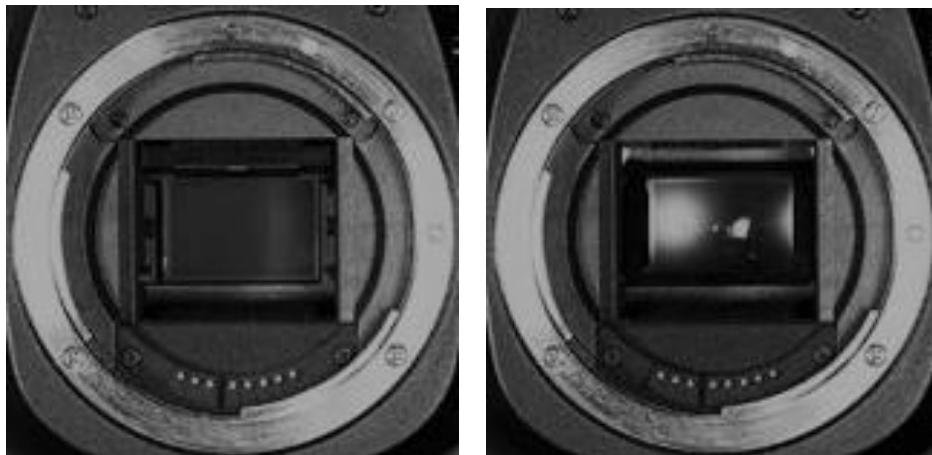
The aperture is like the pupil.



Camera

Exposure works in the same way as the eye. When light is coming into the camera an image is formed on the sensor. If the amount of light is not controlled, the images are going to become either too dark or too bright. Too little light entering the sensor results in the image becoming under exposed. Too much light entering the sensor results in overexposure. Getting the correct exposure is trying to reproduce the scene/subject as it is seen by human vision.

The camera has two mechanisms to control the light, the shutter inside the camera and the aperture inside the lens.



Mirror inside camera body. The mirror remains closed while you are looking through the viewfinder.

As the picture is being taken, the mirror opens up and reveals the sensor behind it, which records the image.

Three mechanisms to take a picture

Aperture

It is exactly like the pupil and opens and closes to change the flow of light coming into the camera. The bigger the aperture, the more light comes in. The smaller the aperture, the less light comes in. The Aperture controls the quantity of light coming into the camera.

Shutter

It stops light from coming into the camera. It blocks the light sensitive surface from receiving any more light. The Shutter controls the duration of time that light is allowed to enter the camera.

Digital Sensor

Records the picture.

Exposure

Exposure refers to getting the right amount of light into the camera in order to capture the scene as the human eye sees it.

There are 3 main terms concerning Exposure:

Over Exposure

The sensor received too much light so the image is too bright.



Correct Exposure

The sensor received the right amount of light so the image represents exactly what the scene looked like.



@Jonathan Petersson

Under Exposure

The sensor did not receive enough light. so the image is too dark.



Shadows and Highlights

Shadows

Shadows create depth, texture and shape. When an image is under exposed, the details in the darker areas are affected.



@Walkerssk

Correct Exposure



Under Exposure



Highlights

Highlights create detail, texture and dimension. When an image is over exposed, the details in the brightest areas are affected.

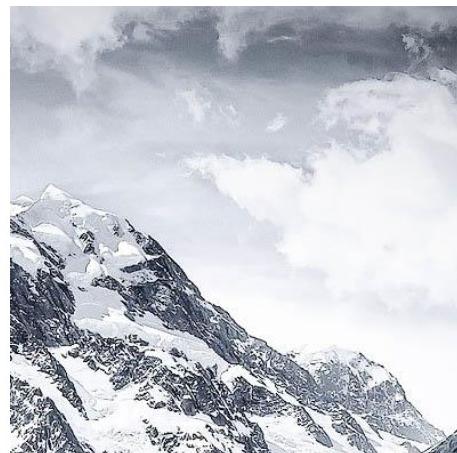


@Walkerssk

Correct Exposure



Over Exposure



Chapter 4 Motion and Depth



Controlling Motion and Depth of Field

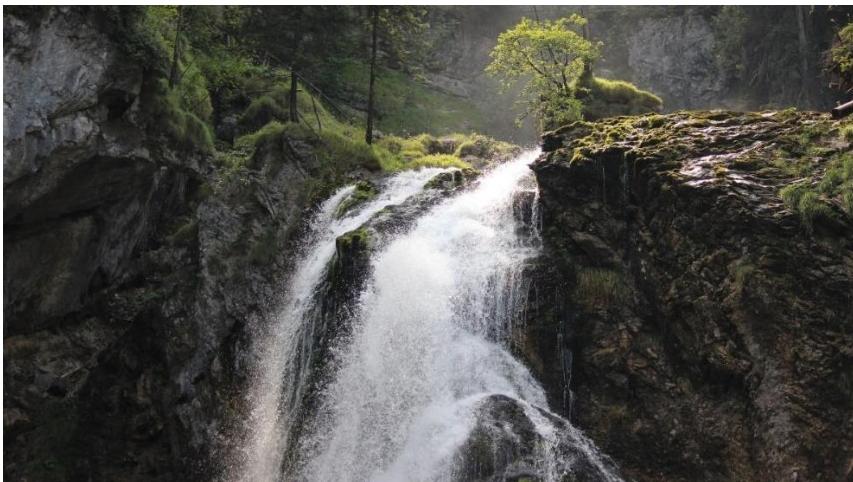
Motion

Knowing how the shutter speeds work allows control of the outcome of a photograph and informs decisions such as whether to freeze a subject in motion or to blur the subject.

Controlling motion helps to get more consistent results and expand creative potential.



@Ingo Jakubke



@Reinhold Schlager

Depth of Field

Understanding how the apertures work will give the ability to control the depth of field.

Controlling depth of field gives power over the exposure thus getting more consistent results.



@Pexels

Focal Plane Shutter

Film

There are different types of shutter but the most common in today's cameras is the Focal Plane Shutter, which is located directly in front of the camera's sensor.

With Film cameras, the shutter speed dial is used to set the time and when the shutter button is pressed, the shutter moves out of the way allowing the light sensitive film to receive light for the period of time selected.

DSLR

The process is the same but is controlled electronically rather than mechanically.

The camera's processor transmits to the shutter how long it should be open. The light comes into the lens, gets redirected upwards to the pentaprism and an image appears in the viewfinder.

When the shutter button is pressed all the way down, the camera's mirror moves up out of the way and allows the sensor to receive light to record the photograph. This is called the Reflex within the DSLR.

Shutter Speeds

The shutter controls the duration of time that light enters the camera and is exposed to the sensor. The length of time that the shutter is open is known as the Shutter Speed.

If there is a need for more light, then the shutter will be open for a longer period of time.

If there is a need for less light, then the shutter will be open for a shorter period of time.

Shutter Speeds are measured in seconds and fractions of a second.

Common Shutter Speeds:

1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250 - 1/500 - 1/1000 - 1/2000 - 1/4000 - 1/8000

These are fractions of a second, and they can go beyond this into seconds as well.

The higher the number, the faster the shutter closes and the less light enters the camera, so the light is entering the camera for a shorter period of time.

The lower the number, the slower the shutter closes and the more light enters the camera, so the light is entering the camera for a longer period of time.

Shutter Speeds on the camera:

2 - 4 - 8 - 15 - 30 - 60 - 125 - 250 - 500 - 1000 - 2000 - 4000 - 8000

Seconds on the camera:

1" - 2" - 4" - 8" - 15" - 30"

Shutter Speed



Motion

Besides controlling the duration of time that light enters the camera, Shutter Speeds also control the Motion, as a secondary function.

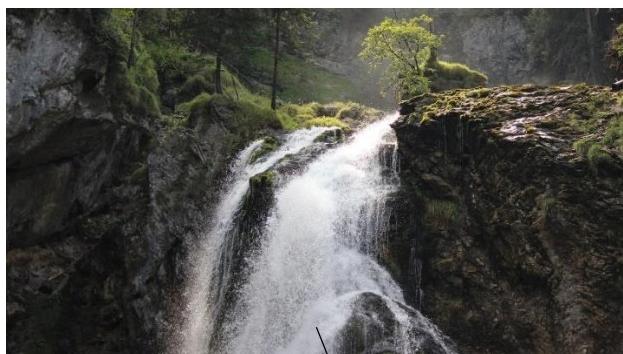
When using fast shutter speeds, the subject, whether moving or stationary, does not have much time to move while the shutter is open and becomes frozen.

When using slow shutter speeds, the subject has time to move slightly through the scene but it becomes blurred.



@Ingo Jakubke

1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250 - 1/500 - 1/1000 - 1/2000 - 1/4000 - 1/8000



@Reinhold Schlager

1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250 - 1/500 - 1/1000 - 1/2000 - 1/4000 - 1/8000

Fast Shutter Speeds



@Free-Photos

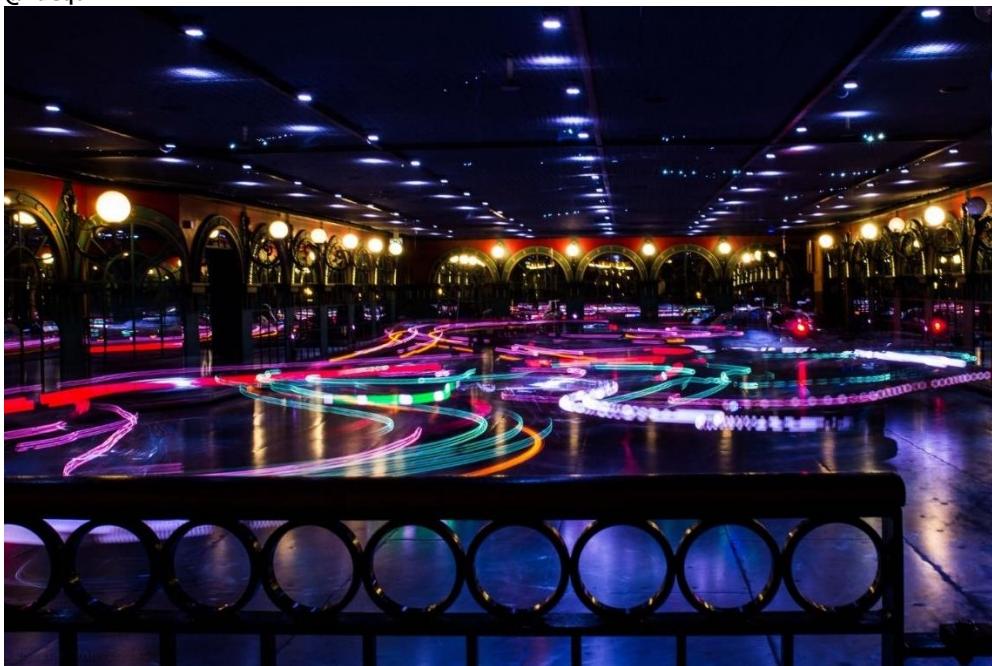


@Raul Olave

Slow Shutter Speeds



@Luisqb



@vzoesto

Camera Shake

Being aware of camera shake while using shutter speeds is extremely important.

Using slow shutter speeds causes movement while holding the camera, consequently causing a blurred image.

While holding the camera when taking a photograph, micro vibrations are always present and this could have a huge impact on the photographs.

Tripods are extremely important when using very long exposures.

There is a very useful function called Image Stabilization, which is situated either in the lens or in the camera's body, and as its name says, it stabilizes the image.

It is recommended to have it ON but when using the tripod, Image Stabilization should be switched OFF, otherwise camera shake may occur.



@Alexandra, München

Apertures

The Aperture controls the amount of light coming into the camera. It is a mechanism inside the camera's lens.

The aperture works exactly like the pupil in the human eye does. They will become bigger or smaller depending on lighting conditions.

Less Light



Apertures are expressed as **F Numbers** or **F Stops**.

Each lens has a certain range of standard aperture sizes.

Common Apertures - **F Stops:**



The higher the F Stop (hole), the smaller the number is.

The smaller the F Stop (hole), the higher the number is.

Aperture



Depth of Field

Besides controlling the volume of light entering the camera, Apertures also control the Depth of Field, as a secondary function. It is how much of the scene is in focus, from the foreground all the way to the background.

Depth of Field allows to objects in the background to be blurred while having the intended subjects in focus.

Shallow Depth of Field

While the background is blurred, a small area in the foreground is in focus. The smaller the aperture/F Stop, the more light is coming in and the shallower the depth of field is.



@MSR_Photography

Deep/Wide Depth of Field

Everything in the scene is sharp and in focus. The bigger the aperture/F Stop, the less light is coming in and the depth of field becomes deeper.



@Christel

Chapter 5 Composition



Composition

Composition refers to the placement and relationship of the elements within a picture and is one of the most fundamental aspects of a photograph. The arrangement of elements in a scene, the angle they are shot at and the distance the photo is taken from, can completely change the final outcome of the photograph. Composition can determine the difference between a good and bad picture.

Good composition is about arranging the elements to create a strong image in order to draw the viewer's eyes to a specific subject in the scene and not wander around and trying to understand what the subject is.



@Quang Nguyen vinh

Camera Vs Human Vision

Despite an angle of view of 130 degrees, the human eye can only focus on a 50 degree field. Whereas a lens can focus on everything in its field. This is the main difference between the human eye and a lens.

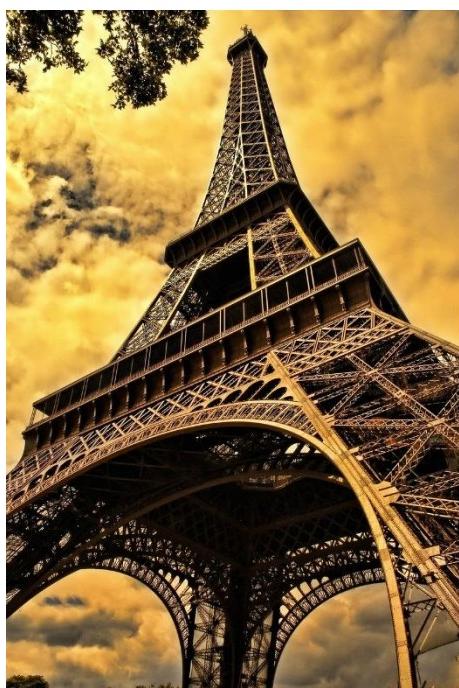


@12019



Exploring the Subject/Scene

Every scene/subject must be explored in order to get a strong photograph. All the possibilities must be considered before taking the shot and this means getting in closer or further away from the subject, getting higher or lower, using different angles, changing lenses and trying different compositional techniques.



@Edi Nugraha



@Polly Ata



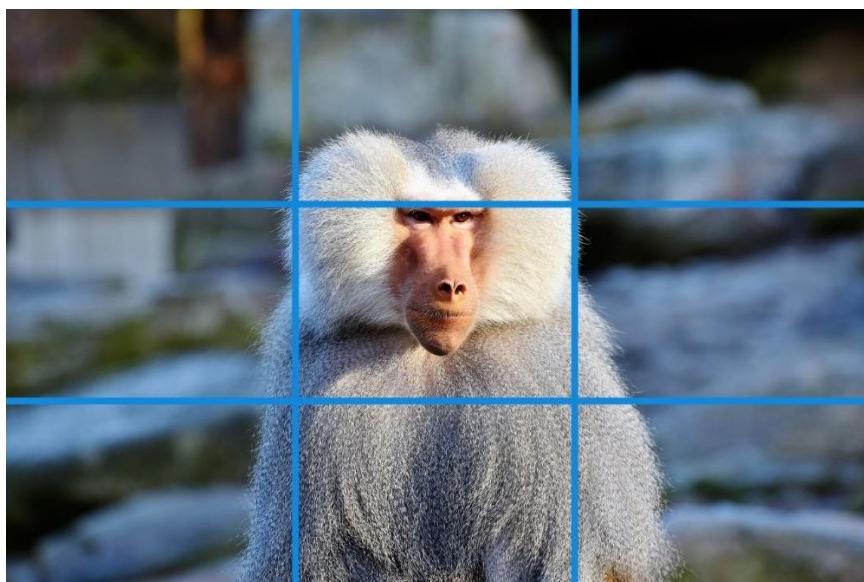
@daviddeolindo22

Compositional Techniques – Rule of Thirds

The concept dictates that an image should be imagined as being divided into nine equal parts by two equally spaced horizontal lines and two equally spaced vertical lines. The important compositional elements should be placed along these lines or their intersections points.



@Markus Distelrath



@Capri23auto

Compositional Techniques – Balance

Every element in an image has a compositional weight.

If there is a strong visual element in one side of the image and nothing on the other side, then this creates an unbalanced image. Visual weight can be created by an object, a tone or a colour and it should be distributed equally throughout the scene. This allows the viewer's eye to travel around the entire frame easily.

If the eye is constantly pulled towards a specific subject it is because the image is not balanced.



@Hermann Schmider



@Hermann Schmider

Point of View

Not every composition works when shooting from an eye level. Using unusual angles like getting down really low or getting up high above the subject gives different perspectives and creates new experiences for the viewer.



@Peter H



@rex Takahashi

Simplicity

Simplicity refers to the ease of understand what the image is all about. Trying to minimize the content of the composition allows the viewer to focus on the main subject and not be distracted by unnecessary objects within the frame.



@Ina Hoekstra



@U. Leone

Advanced Composition Techniques

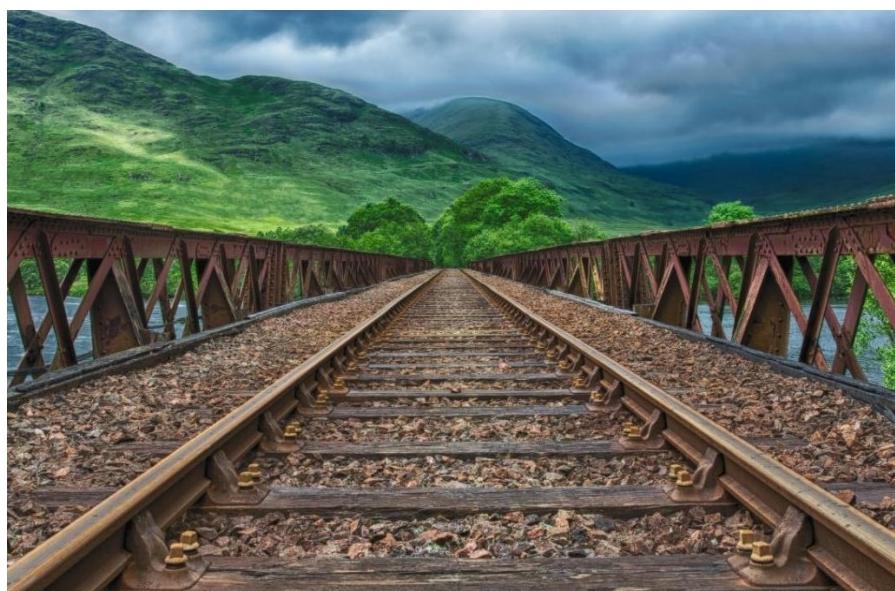
Lines

Lines create very strong compositions as they lead the viewer's eye into the frame and back out of it. They can be a strong structure or forms or they can be soft or natural lines found in nature.

Lines can create a visually interesting image when the subject does not have anything to work with.



@Sasin Tipchai



@Peter H

Shapes

Shapes can be subtle, implied or a combination of forms to create them. Shapes do not always have to be apparent or solid for them to be effective because the human brain will naturally make the connection between the shapes and fill in the blanks.



@Free-Photos



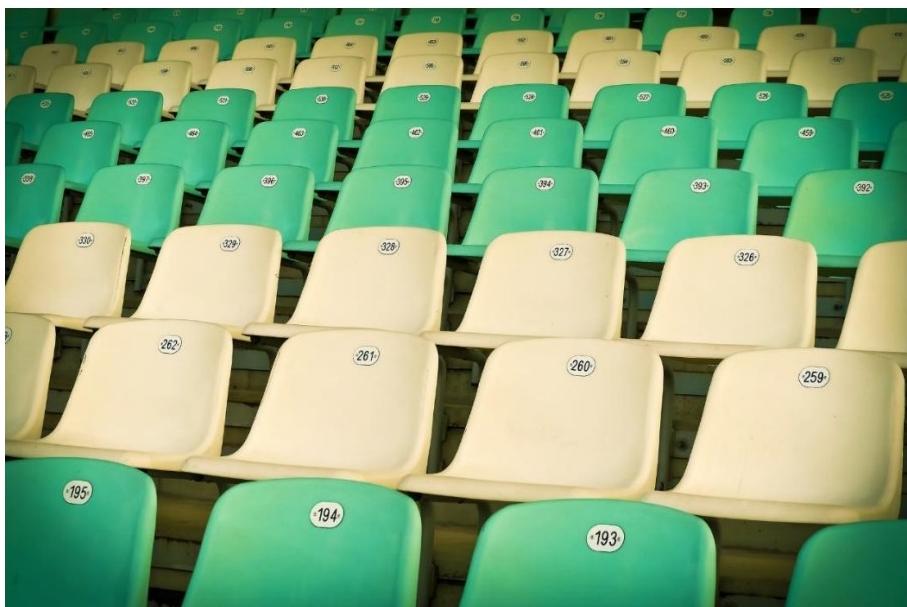
@Paul McGowan

Repetition

Repetition can be shapes, lines, textures or any form. It creates structure and order.



@Evgen Rom



@Michael Gaida

Rule of Threes

The Rule of Threes is distinct from the Rule of Thirds. When there is only one subject in an image it feels isolated. When there are two subjects it creates a pair that balance one another, but when there are three subjects, a pattern starts to form and repetition starts to come into play. It is just a simple guideline for creating repetitive patterns or compositions.



@Daja Gellerova



@Merja Partanen

Symmetry

Symmetry is all about creating balance. It is a strong compositional element and creates very powerful and visually appealing images. Reflections are a very good example of symmetry.



@Julius Silver



@12019

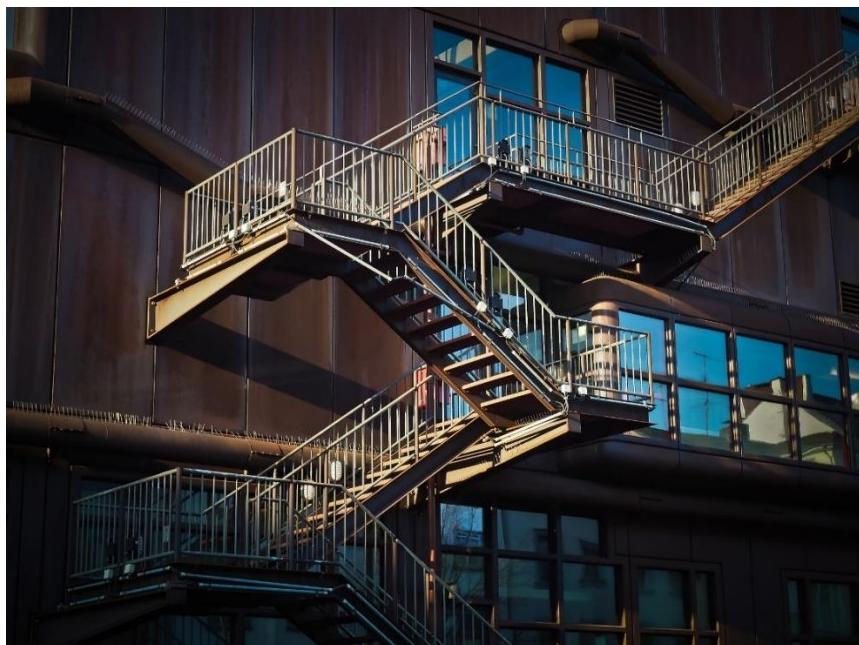
Entry and Exit

Entry and Exit refers to guiding the viewer's eyes from one side of the image to the other side.

Creating entry and exits points can be achieved by using lines, shapes, objects, perspective, etc. It is used to create order in the scene.



@Alex Hu



@Michael Gaida

Framing

A frame is the boundaries of a photograph. It is possible to create frames within frames to emphasize the subject. They are a very strong visual element and the main goal is to draw attention to the subject.



@Oberholster Venita



@706341

Visual Consistency

Visual Consistency refers to having structure in the composition or some link between the images thus making the viewer understand that they are related.

This situation is applicable in cases in which there is a need to associate images to a context, such as articles, interviews, etc.

Creating a set of images and linking them together will make it easier to the viewer to move from one image to another without confusion.

Incorrect Visual Consistency



Correct Visual Consistency



@Hans Braxmeier



Chapter 6 Light Meter



Light Meter and Modes

The Light Meter gives information about the quantity of light that is coming into the camera, whether it be too much, too little or the correct amount of light.

In order to make the proper adjustments in the camera it is crucial to understand how the Light Meter operates.

The Light Meter operates on an assumption that the camera requires exposure settings reflecting 18% of the ambient light conditions to produce good exposure.

Automatic Mode

In Automatic Mode, when the shutter button is pressed halfway down, the Light Meter transmits to the camera, information about how much light is coming into the camera and the camera attempts to achieve a meter reading of 0 (zero) by readjusting the Aperture and Shutter Speed settings to obtain the correct exposure.

The Light Meter is locked at 0.

Semi/Auto Mode

In Semi-Automatic Mode, the Light Meter continuously recalculates and measures the light, in order to achieve a meter reading of 0 (zero).

Since in this mode the user controls one setting, such as the Shutter speed or the Aperture, the camera uses the opposite function to ensure that the right amount of light is coming into the camera.

The Light Meter is locked at 0.

Manual Mode

In Manual Mode, the user has total control over the camera. The user changes the Aperture, Shutter Speed and ISO settings to maintain the Light Meter at 0 (zero) and to obtain good exposure.

The Light Meter does not lock at 0.

Stops of light

The Light Meter measures light in Stops.

A Stop in photography refers to a measure of light.

A Stop is doubling or halving of the amount of light in the scene.

Any time the amount of light getting to the camera's sensor is doubled, the light increases by 1 Stop.

Any time the amount of light getting to the camera's sensor is halved, the light decreases by 1 Stop.

The Light Meter has a scale with 0 (zero) on the centre, -1 and -2 on the left and +1 and +2 on the right. Some Light Meters go beyond -2 and +2.

The 0 (zero) symbolizes the correct exposure. The camera is receiving enough light based on 18% reflectance.

-2..-1..0..+1..+2



+1 Stop - Double the amount of light getting to the sensor that is needed to correctly expose the scene.

+ 2 Stops - Four times the amount of light getting to the sensor that is needed to correctly expose the scene.

+ 3 Stops - Eight times the amount of light getting to the sensor that is needed to correctly expose the scene.

-2..-1..0..+1..+2



-2..-1..0..+1..+2



-1 Stop - Half the amount of light is getting to the sensor that is needed to correctly expose the scene.

-2 Stops - Four times less light is getting to the sensor that is needed to correctly expose the scene.

-3 Stops - Eight times less light is getting to the sensor that is needed to correctly expose the scene.

-2..-1..0..+1..+2



-2..-1..0..+1..+2





-2..-1..0..+1..+2



-2..-1..0..+1..+2



@StockSnap

-2..-1..0..+1..+2



-2..-1..0..+1..+2



-2..-1..0..+1..+2

Exposure for Light and Dark Tones

When using the Semi-Manual Mode, problems with exposure can occur as the Light Meter; operating on the 18% principle, assumes that every tone is the same. It treats a black object and a white object as if they are reflecting the same amount of light, which of course they do not. This can be problematic as it can cause images to be over or under exposed. In other words, the camera tries to give the same exposure to all black and white objects.

Light Tones

The light meter follows the 18% principle and as a result the photo ends up with an under exposed scene.



Under Exposure



Correct Exposure

@Larisa Koshkina

Dark Tones

The light meter follows the 18% principle and as a result the photo ends up with an over exposed scene.



Over Exposure



Correct Exposure

@Harut Movsisyan

Exposure Compensation

When using the Automatic and Semi-Automatic Modes, over and under exposure issues are going to be prominent.

When faced with a subject or scene with a lot of highlights, the camera can underexpose the scene by not letting enough light in and not allowing the subject to brighten up to the right level.

When faced with a subject with a scene with a lot of dark tones, the camera can overexpose the scene by letting too much light in and over brightening the scene.

To correct this issue there is a function called Exposure Compensation, which allows the camera to over or under expose a scene to compensate for this issue.

Exposure Compensation allows the user to dial in the amount of light needed to over or under expose in Stops.

Exposure compensation is only for Program Modes.



Chapter 7 Manual Mode



Manual Mode

Using the Aperture Value Mode and Shutter Priority Mode the user is giving up on one visual element over the other. To overcome this, the best way to have full control over the camera is to use Manual Mode, it will give the best results in terms of motion and depth of field.

To obtain correct exposure, the first step is to perform a Light Meter reading. Following this, adjustments of the settings, like Aperture, Shutter Speed and ISO, should be made in order to achieve the best results.

Metering in Manual Mode

The Light Meter establishes its reading based on the camera's current Aperture and Shutter Speed settings, meaning that it takes its readings from the last setting the user selected because there is no reset on the camera. So, adjusting the Light Meter to the centre is crucial.

From the information the Light Meter gives, whether there is too much light or too little light coming in, decisions about the settings should be made.

The Light Meter is adjusted by changing the Apertures and the Shutter Speeds.



Connection between Shutter Speeds

The connection between each Shutter Speeds is 1 Stop. Every time the Shutter Speed is changed, it allows 1 Stop more light into the camera or 1 Stop less light into the camera.

Each time the Shutter Speed is changed to a slower speed, more light is allowed in by 1 Stop.

Example: If the Shutter Speed is changed from 250/s to 125/s, the shutter is now open for twice the length of time, therefore double the amount of light enters the camera, which increases the light by 1 Stop.

Each time the Shutter Speed is changed to a faster speed, less light is allowed in by 1 Stop.

Example: If the Shutter Speed is changed from 30/s to 60/s, the shutter is now only open for half the length of time, therefore half the amount of light enters the camera, which decreases the light by 1 stop.

Common Shutter Speeds:

1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250 - 1/500 - 1/1000 - 1/2000 - 1/4000 - 1/8000

Each Shutter Speed is 1 Stop apart.

The smaller the number, the slower the Shutter Speed.

The bigger the number, the faster the Shutter Speed.

The slower the Shutter Speed, the more you can blur the shots.

The faster the Shutter Speed, the more you can freeze the shots.

Connection between Apertures

The connection between each Apertures is 1 Stop. Every time the Aperture is changed, it allows 1 Stop more light into the camera or 1 Stop less light into the camera.

Apertures are expressed in F Numbers or F Stops.

Each lens has a specific range of standard Aperture sizes.

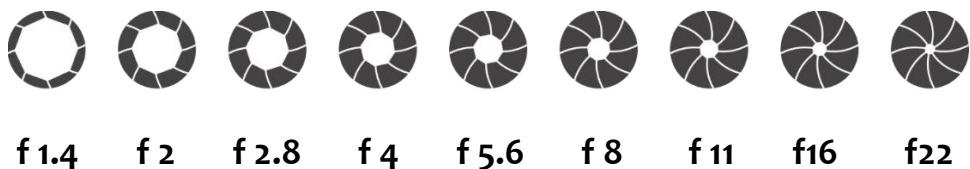
Each time the Aperture is enlarged (decreased in number), more light is allowed in by 1 Stop.

Example: If the Aperture is changed from f11. to f8, the Aperture is twice as large, therefore double the light enters the camera, which increases the light by 1 Stop.

Each time the Aperture is reduced (increased in number), less light is allowed in by 1 Stop.

Example: If the Aperture is changed from f2.8. to f4, the Aperture is now half the size, therefore only half the light enters the camera, which decreases the light by 1 Stop.

Common Apertures - F Stops:



Each Aperture is 1 Stop apart.

The smaller the Aperture number / F Stop, the wider the Aperture (hole) is.

The bigger the Aperture number / F Stop, the smaller the Aperture (hole) is.

Adjusting Shutter Speed

To allow more light into the camera, the Shutter Speed needs to be slower to achieve a Light Meter reading of 0 (zero).

To allow less light into the camera, the Shutter Speed needs to be faster to achieve a Light Meter reading of 0 (zero).

When altering Shutter Speeds to control the light, always consider that Shutter Speeds also affect the Motion in the photographs.

Shutter Speeds:

1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250 - 1/500 - 1/1000 - 1/2000 - 1/4000 - 1/8000



Current Shutter Speed and Aperture:
1/250 F22

Current Light Meter Reading:
-2..-1..0..+1..+2



1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250 - 1/500 - 1/1000 - 1/2000 - 1/4000 - 1/8000



New Shutter Speed and Aperture:
1/125 F22

New Light Meter Reading:
-2..-1..0..+1..+2



@Robert C

**1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250 - 1/500 - 1/1000 - 1/2000 -
1/4000 - 1/8000**



**Current Shutter
Speed and Aperture:**
1/15 F16

**Current Light Meter
Reading:**
-2..-1..0..+1..+2

■

**1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250 - 1/500 - 1/1000 - 1/2000 -
1/4000 - 1/8000**



**New Shutter Speed
and Aperture:**
1/60 F16

**New Light Meter
Reading:**
-2..-1..0..+1..+2

■

@Thomas Zbinden

Adjusting Aperture

To allow more light into the camera, the Aperture needs to be bigger to achieve a Light Meter reading of 0 (zero).

To allow less light into the camera, the Aperture needs to be smaller to achieve a Light Meter reading of 0 (zero).

When altering Apertures to control the light, always consider that Apertures also affect the Depth of Field in photographs.

F Stops:

f 1.4 f 2 f 2.8 f 4 f 5.6 f 8 f 11 f16 f22



Current Shutter Speed and Aperture:
1/125 F16

Current Light Meter Reading:
-2..-1..0..+1..+2
|

f 1.4 f 2 f 2.8 f 4 f 5.6 f 8 f 11 f16 f22



New Shutter Speed and Aperture:
1/125 F8

New Light Meter Reading:
-2..-1..0..+1..+2
|

@Yerson Retamal

f1.4 f2 f2.8 f4 f5.6 f8 f11 f16 f22



Current Shutter Speed and Aperture:
1/125 F2.8

Current Light Meter Reading:
-2..-1..0..+1..+2



f1.4 f2 f2.8 f4 f5.6 f8 f11 f16 f22



New Shutter Speed and Aperture:
1/125 F4

New Light Meter Reading:
-2..-1..0..+1..+2



@Marko Lovric

ISO

ISO refers to the sensitivity of the sensor. It allows the sensitivity of the sensor to be changed.

The ISO setting is like the Shutter Speed and the Aperture, it is adjusted in Stops.

Each time the ISO setting is increased, the sensitivity of the sensor is doubled.

When there is insufficient light for a desired shutter speed, the ISO can be increased to achieve a Light Meter reading of 0 (zero).

Altering ISO however, comes with a drawback. Noise or grain will start to appear as the ISO is increased. The higher the ISO gets, more noise/grain will appear.

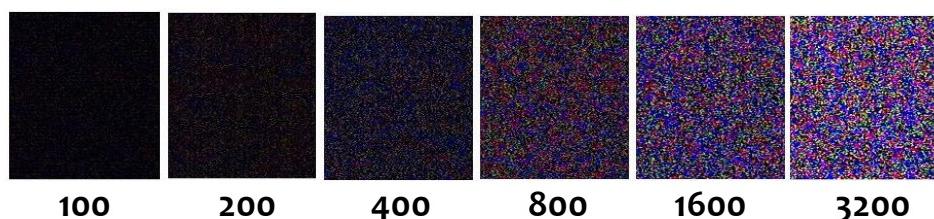
To maintain the best quality in a photograph, the ISO should be kept as low as possible and it should only be changed when there isn't enough light coming in with the selected Shutter Speed and Aperture.

Standard ISO Numbers:

100 – 200 – 400 – 800 – 1600 – 3200 – 6400

Each ISO is 1 Stop apart.

ISO Noise:



Standard ISO Numbers:

100 – 200 – 400 – 800 – 1600 – 3200 – 6400



Current Shutter Speed and Aperture:
1/500 F22

Current Light Meter Reading:
-2..-1..0..+1..+2

Current ISO: 100

100 – 200 – 400 – 800 – 1600 – 3200 – 6400



New Shutter Speed and Aperture:
1/500 F22

New Light Meter Reading:
-2..-1..0..+1..+2

Current ISO: 200

@Pexels

Chapter 8 White Balance



White Balance

White Balance refers to matching the colours of an image to how they are perceived by the human eye.

Maintaining the colours in an image as the human eye sees it is crucial. This is where White Balance comes in. It helps balancing the colour tones in an image. Without White Balance the colours in an image will look monotonous and toneless.

There are lots of different light sources such as the sun, fluorescent light, LED's, tungsten lights (lamp), flash, etc. Each of them have what is called a Colour Temperature, which means that the colour of light that it produces is very unique.

Colour Temperature

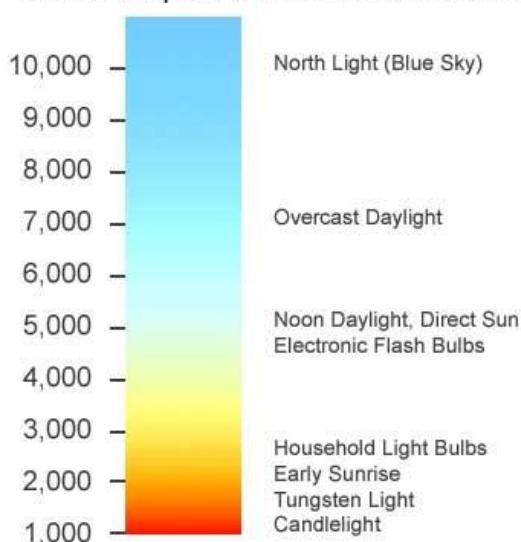
Colour Temperature is a physics term. The temperature of the heat of a light source is totally different to the colour it emits.

The different colours that light produces are measured on a scale called The Kelvin Scale.

The lower temperature is a warmer looking colour.

The higher temperature is a cooler looking colour.

Colour Temperatures in the Kelvin Scale



Daylight/White Light

White is a colour that has no cast and is a neutral light source. When photographing a white scene the light is white light, so when it falls on the subject, all the colours of the scene will look correct because they are not contaminated by the colours within the light source. An image is not contaminated if the whites are white, therefore all the other colours will be represented naturally.



@Denis Linine

Fluorescent Light

Typically lights found in an office or in a kitchen. They range from around 4.000 to 7.000 Kelvins.



@StartupStockPhotos

Candle Light

Contrary to its appearance, it is a cold light source in terms of physics. It has a very low temperature in terms of Kelvins, between 1.500 to 2.000 Kelvins, and the colour it produces is a very strong red or orange tone.



@Myriams-Fotos

Morning / Evening Light

It presents a higher temperature of around 2.000 to 5.000 Kelvins, and it produces a strong orange red tone on the image.



@kordula vahle

Tungsten Light

This type of light usually comes from standard lamps.
It produces a very yellow tone.



@Steve Buisinne

Cold Temperatures

They have a temperature that ranges from 6.500 Kelvins and it produces a cold blue light in photographs.



@Simon Matzinger

Auto White Balance / AWB

The camera chooses the colour of the brightest object in the scene and assumes its colour to be white. Then it adjusts the colour temperature of the overall scene to ensure that the brightest object appears as pure white. The downside is that the brightest object in the scene might not be white and the resulting image will be inaccurate.



Corrected Image:



@StockSnap

White Balance Pre – sets

When the Auto White Balance does not perform as desired, the White Balance Pre-sets on the camera can be utilised.

When the lighting conditions change, it will affect the White Balance as well.

These pre-sets are aimed at common light situations.

Most commonly found pre-sets:



Manual/Custom White Balance

A way of manually controlling White Balance is to use a Grey Card/White Card. It should be placed in the scene and in the same lighting conditions as the subject.

By taking a photograph of the card, the camera will examine the colour and will inform the user as to the best White Balance setting to use.

Correcting White Balance in Post - Production

Another way of manually controlling White Balance is in Post-Production.

Software Programmes with image editing tools that helps to set the White Balance are readily available.

Chapter 9 The Pixel



Image Size

Image Size refers to the quality of the image. It will determine the quality of the final outcome.

For images destined for a screen (such as televisions, computers and other devices), they should be of a low size otherwise while opening/loading them it will take too long and the viewer will lose interest.

For images destined for printing, if the image size is not big enough, they will look pixelated when trying to enlarge them.

The Pixel

Pixel stands for Picture Element.

A Megapixel is one million pixels. For example, a 5 megapixel camera can create images with five million pixels.

An image is made of Pixels and when zoomed to its maximum, Pixels will start to appear.

The Pixel is a single square of colour and it can only ever be of one colour.

Pixels are built up together in horizontal and vertical lines and this is how an image is formed.

The more Pixels there are in an image, the smaller they are and the less they are visible to the human eye. They will look less like individual squares and will start to look more like a continuous tone.



@Rita Craveiro



Resolution

The Resolution is how many Pixels there are in an image. It is measured in PPI (Pixels Per Inch) or DPI (Dots Per Inch).

PPI is the number of Pixels that appear in an inch of a digital screen. DPI is a printing expression and it is the number of dots of ink there are in a printed image.

Low-Resolution images are used on screen and High-Resolution images are used for printing.

High Resolution

In a High-Resolution image it is harder to identify the Pixels when zooming in because the image has so much detail and definition. The colours of the Pixel squares have a smooth transition.

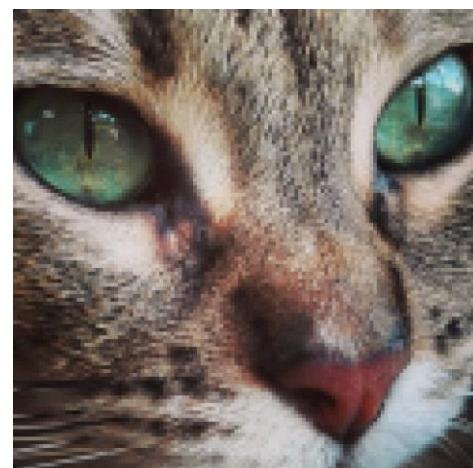
Low Resolution

In a Low-Resolution image it is easy to identify the Pixels when zooming in because the image has no definition. The colours of the Pixel squares have a rougher transition.



@Rita Craveiro

High Resolution



Low Resolution

Calculating Resolution

Pixels are very small squares ordered in the form of a grid and they are calculated by multiplying the length of the image by its width.

For example, if the length of the image is of 5616 Pixels and its width is of 3744 Pixels, then the total resolution of the image will be $5616 \times 3744 = 21,026,304$ Pixels. So it is a 21 Mega Pixel camera.

5616 Pixels



@Christine Sponchia

3744 Pixels

Total number of Pixels:

$$5616 \times 3744 = 21.026.304$$

21 Mega Pixel Camera

Chapter 10 File Formats

File Formats

RAW and JPEG/JPG are the most common files used by photographers and are the two primary formats.

RAW

- Offers full control in terms of editing afterwards, therefore it will require plenty of work in post-production.
- Greater dynamic range. Get the full quality from the camera sensor. It will capture more detail when there are dark and light areas at the same time.
- Larger colour space. It can reproduce much more colour.
- Work on a file over and over again without losing image quality.
- It is an unprocessed format – directly records the scene without internal processing by the camera. When shooting a black and white picture it will appear in black and white in the camera but when uploaded into the computer, it will appear in colours. This is because the previews seen in the camera are in JPEG.
- Uncompressed format – It maintains all the information captured by the sensor.
- Proprietary file format – Each manufacturer has their own RAW file and it has to be processed by a specialized software.
- Full control over the image settings after an image is shot.
- Very large file sizes – Takes more space to store, less shots per card.
- May look flatter and less vibrant than the JPEG initially.
- Not suitable for sharing/printing without first being edited and converted to another file format.
- Processing RAW file is a non-destructive editing process, which never overwrites the original file. Digital negative.

JPEG/JPG

- It is quick to use and useful but ultimately there are a lot of fundamental changes applied that cannot be undone, such as colour saturation, contrast, sharpness, noise reduction, etc.
- Standard format for photographic images.
- Non-proprietary – does not need specialized software to view file.
- Small file size – Takes less space to store, more shots per card.
- Images shot in JPEG are processed in the camera and are ready for use.
- Compressed format – Quality is degraded to obtain smaller file sizes and are continuously degraded through editing. Every time a JPEG file is opened and closed, it gets compressed. Eventually it begins to deteriorate and pixels start to become more evident.
- Reduced dynamic range – Poor highlight / shadow recovery.



The Perfect Shot

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